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Resumptive pronouns and active dependency formation

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BACKGROUND

Resumptive pronouns (RPs) are overt pronouns where a gap would normally be expected:

(1) **Example with a RP:** Jane liked the magazine that the hairdresser had talked about it before going to the salon.

(2) **Example with a gap:** Jane liked the magazine that the hairdresser had talked about before going to the salon.

➤ RPs are ungrammatical in English.

➤ It has been suggested RPs can facilitate sentence comprehension (Beltrama, & Xiang, 2016).

➤ RPs are acceptable under certain conditions (Hofmeister & Norcliffe, 2013).
 (e.g., When RPs appear in contexts where a gap would cause an island violation [Beltrama, & Xiang, 2016]).

➤ Most studies have focused on how RPs affect global acceptability. Here we report: (a) how RPs are processed during incremental comprehension, and (b) how this relates to reading skill.

➤ **Active dependency formation:** Filler-gap dependencies are formed actively (Frazier, 1987).

➤ However, active dependency formation is sensitive to islands and thus such a filled gap effect is ineffective in sentences with islands (Stowe, 1986; Traxler & Pickering, 1996)

Our predictions:

➤ Relying on active dependency formation, **we predict:**

(1) If filler-gap dependencies are formed actively, then processing difficulty should be observed in [1] at or around the RP (it), due to the disconfirmed prediction of a gap in this position.

(2) If active dependency formation is sensitive to islands, such a filled gap effect should not be observed in [2], where it appears inside a strong (relative clause) island.

Experiment 1

Method

➤ ($n=40$) Native English-speaking volunteers: 40 items, eye-tracking during reading, Eyelink 1000K (SR Research Ltd), (non-island vs. island) (pronoun vs. gap)

Conditions

[1] **RPs in the non-island condition.**

(e.g.) Jane liked the magazine that the hairdresser had talked/ about **it/ before/** going to/the salon.

[2] **RPs in the island condition.**

(e.g.) Jane liked the magazine that the hairdresser [_{RC} who had talked/ about **it/ before/**going to/ the salon] bought.

[3] **A gap in the non-island condition.**

(e.g.) Jane liked the magazine that the hairdresser had talked/ about **before/** going to/ the salon.

[4] **A gap in the island condition.**

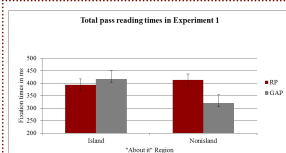
(e.g.) Jane liked the magazine that the hairdresser [_{RC} who had talked/ about/ **before/** going to/ the salon] bought.

Results

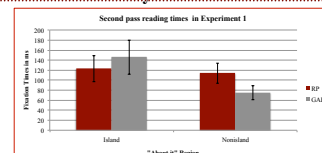
As predicted, LMER analyses of multiple eye-movement measures in regions at or following the pronoun/gap-site revealed:

➤ active dependency formation lead to interaction in the non-island context and processing difficulties in [1] relative to a gap in [3] due to the filled gap effect.

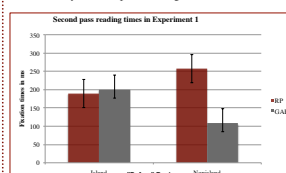
➤ However, this contrast is not seen in the island context.



LMER analysis: total pass reading times: $t = 4.529$



LMER analysis: second pass reading times: $t = 2.913$



LMER analysis: second pass reading times: $t = 5.693$



LMER analysis: first-pass regressions out: $Z = 3.629$

Experiment 2

Method

➤ The method was identical to that used in Experiment 1.

Conditions:

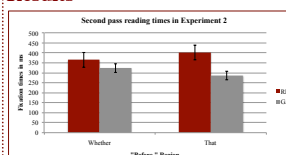
1/2- RP or a gap in that complement condition (corresponding to non-island in Exp 1)

➤ This is the magazine that Jane said **that** the hairdresser had talked/ about (it)/ before/ going to/ the salon.

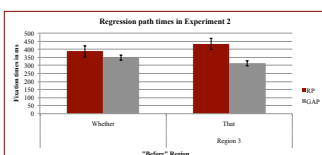
3/4- RPs or a gap in the weak island condition.

➤ This is the magazine that Jane wondered **whether** the hairdresser had talked/ about (it)/ before/ going to/ the salon.

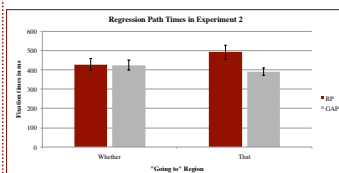
Results



LMER analysis: regression path times: $t = 2.473$



LMER analysis: regression path times: $t = 2.502$

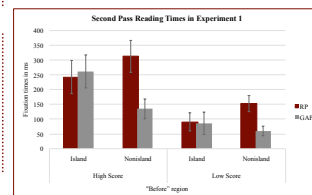


LMER analysis: regression path times: $t = 2.455$

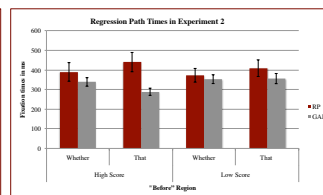
OVERALL RESULTS FROM EYE-TRACKING EXPERIMENT

➤ RPs are subject to well-known processing biases relating to active dependency formation and island sensitivity.

INDIVIDUAL DIFFERENCES IN EXPERIMENTS 1 & 2



LMER participants with high scores: $t = 5.047$; low scores: $t = 2.747$



LMER participants with high scores: $t = 2.275$; low scores: $t = -1.819$

➤ Nelson Denny Test was used.

➤ (1) The magnitude of the observed two-way interaction in each experiment was greater for high-skilled readers than for low-skilled readers

➤ (2) This indicates that active dependency formation and/or island sensitivity is subject to individual differences in skill.